Social Presence Questionnaire of Online Collaborative Learning: Development and Validity

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Abstract

This study articulates the construct of social presence and develops a social presence questionnaire for examining online collaborative learning with tests for reliability and validity. Questionnaire items were developed by revising the social presence questionnaire developed by Picciano in 2002 as well as reviewing research in the literature of computer support for cooperative systems (CSCW). Twenty items were developed and administered to 15 graduate students taking an online course. Exploratory factor and reliability analyses resulted in the identification of 12 items reflecting online social presence.

Introduction

Computer mediated communication (CMC) is a substantial aspect of learning at a distance, and Short et al. (1976) claim that social presence is the critical factor in a communication medium. Social presence is defined as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as real people through the medium of communication being used" (Garrison & Anderson, 2003). Online learning environments which feature mainly asynchronous text-based CMC have been criticized for their lack of support for social presence, and this lack of support for social presence may impact the sense of belonging and acceptance in a group (Rovai, 2002).

In the earliest research of social presence, Short et al. (1976) related the concepts of intimacy and immediacy with social presence. This early work suggested that intimacy and immediacy enhance social presence (Gunawardena, 1995). Social presence also was defined as a quality of the medium itself. They used the semantic differential technique with bipolar scales to assess social presence in face to face television and audio systems around four dimensions: unsociable-sociable, insensitive-sensitive, impersonal-personal, and cold-warm. Since an asynchronous text-based CMC has different attributes from one-way television, Gunawardena (1995) examine social presence as an attribute of a computer conference by revising Short et al.'s scales to 17 5-point bipolar scales that characterized the intimacy of the medium.

Further, Gunawardena & Zittle (1997) developed a social presence scale containing 14 questionnaire items that embodied the concept of immediacy to focus on perceived sense of online community and degree of social comfort with CMC. Tu (2002) argued that current social presence instruments are unable to capture a thorough perception of social presence and asserted that social presence is a complicated construct containing 4 dimensions: social context, online communication, interactivity and privacy. His social presence and privacy questionnaire instrument measures social presence in email, bulletin board and real-time discussions and contains 17 social presence items and 13 privacy items with a five point likert scale and 12 demographic responses. In addition, Rourke et al. (2001) directly examined responses of computer conference participants through content analysis of conferencing transcripts and developed three categories and indicators to assess social presence including affective responses, interactive responses, and group cohesive responses.

Our review of the social presence literature and instrumentation suggests there is still a lack of agreement about how to conceptualize and measure social presence, but that there is also a growing appreciation for its potential to explain participation and outcomes in distance learning. No reliability and validity assessments of the social presence instruments developed by Short et al. in 1976 & Gunawardena in 1995 were reported. For the instrument developed by Gunawardena & Zittle in 1997, concurrent validity of the social presence scales was indicated by the strong and positive correlation with bipolar social indicators based on Short et al.'s instrument; however, the scale itself was not validated. The social presence instrument developed by Tu in 2002 has been validated; however, his instrument mainly focused on participants' attitudes toward CMC in a general context. It is unclear whether the reported relationship between attitude toward CMC and the experience of social presence would hold when confronted with specific tasks or opportunities in specific social groupings.

Previous research has examined the association of social presence with participation and outcomes in distance learning. Social presence has been associated with enhanced online social interaction (Tu & McIsaac, 2002). Social presence is also seen to influence not only online activities generally designated as group projects,

but also those usually designated as individual projects (Richardson &Swan, 2003). In addition, students with high overall perceptions of social presence scored high in terms of perceived learning and perceived satisfaction with the instructor (Richardson &Swan, 2003). Students with high overall perceptions of social presence are also most likely to enhance their socio-emotional experience by adopting different ways to express their affect in an asynchronous text-based learning environment (Gunwardena & Zittle, 1997). Finally research has also shown that instructors or moderators of online communities can cultivate social presence by developing interaction skills that create a sense of social presence (Gunawardena, 1995).

The purpose of the work presented in this paper is to further articulate the construct of social presence and to develop a social presence instrument which can be used to examine social presence in online collaborative learning.

Questionnaire Development

To measure the social presence of students working collaboratively in an online course, two strategies were used to develop items for the social presence questionnaire. First, the first 10 items were developed by surveying social presence literatures and adapting items from the social presence questionnaire developed by Picciano (2002) based on a questionnaire developed by Tu (2001). Second, the last 10 items were developed newly from our reading in the literature of computer support for cooperative systems (CSCW). In this literature there is a greater emphasis on social navigation and awareness of others than we have found in CMC more generally and especially distance learning. This literature emphasizes the role that awareness of the actions of others and the understanding that others are aware of your actions shapes action. See Munro, et al., (1999) and Hook, et al., (2003) for good compilations of this research. In all, 20 statements were created to measure social presence. Statements were placed on a 7-point continuum with endpoints of strongly agree (1) to strongly disagree (7).

Method

In a pilot study the 20 items were administered to 15 graduate students in an online graduate level course delivered through Shadow netWorkspace™ (SNS) during the fall of 2003. SNS is open source software using the GNU General Public License (GPL). The software can be freely downloaded and distributed under the terms of the GPL. Shadow netWorkspace is freely available to anyone at http://sns.internetschools.org. The online course was organized into 8 weekly group activities and two individual projects. After the third weekly activity, all the students were asked to complete the web-based social presence questionnaire.

Exploratory Factor Analysis and Reliability Analysis

Responses to the 20 items were subjected to exploratory factor analysis using principle component with varimax rotation. Initial factor analysis procedure showed the 20 item questionnaire to have three factors having eigenvalues of 8.114, 3.277, and 2.329 that accounted for 40.570%, 16.384%, and 11.643% of the variance, respectively. The factor analysis was repeated and 6 items were deleted since they were found to contribute approximately equally into at least two factors. Finally, the three factors which explained 73.889% of total variance were named as "perception of the assistance of group activity to learning", "social comfort of expressing and sensing affect", and "social navigation". Cronbach's coefficient alpha was computed for the 14

Table 1. *Factor loadings for social presence questionnaire*

Item		Factor loading
Factor 1: Perception of the assistance of group activity to learning		
1	I felt like I was a member of a group during this past week activities	0.753
2	I felt comfortable participating in this past week online group activities.	0.811
8	I felt I came to know the other students in this past week online group activities	0.746
16	This past week online group activities helped me accomplish the assignment with higher quality than if I were working alone.	0.804
17	This past week online group activities helped me learn more efficiently than if I were working alone.	0.831

Factor 2: Social comfort of expressing and sensing affect	
4 I felt comfortable expressing my feelings during this past week activities.	0.833
6 I felt comfortable expressing my humor.	0.918
7 I was able to appreciate the humor of members of the group.	0.867
9 I was able to form distinct individual impressions of some group members during the online group activities.	0.833
Factor 3: Social navigation	
14 Actions by other members of my group usually influenced me to do further work.	0.891
15 Knowing that other members of my group were aware of my work influenced the frequency and/or quality of my work.	0.690
19 Knowing what other members of the group did helped me know what to do.	0.792

item social presence questionnaire as a test of internal consistency. Cronbach's coefficient alpha values for three factors were 0.6747, 0.6649, and 0.7031 respectively. By dropping one item individually from "perception of the assistance of group activity to learning" factor and "social comfort of expressing and sensing affect" factor, their reliabilities were raised to 0.8905 and 0.9218 respectively. Alpha of the entire questionnaire of 12 items was 0.8402 (M=55.6667, SD= 11.8181). The scale's reliability met acceptable standards of 0.70 and above and can be interpreted as internally consistent or as measuring the same phenomenon (Bowers & Courtright, 1984). Table 1 shows factor loadings of three factors for 12 items.

Conclusion

Our work is leading to a social presence questionnaire which can be used in online collaborative learning. The exploratory factor analysis isolated three factors: "perception of the assistance of group activity to learning", "social comfort of expressing and sensing affect", and "social navigation". In this pilot study, the sample size for factor analysis was far from an appropriate sample size of close to 300 cases (Tabachnick & Fidell, 2001); hence, future studies are planned with larger sample sizes.

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